इंटरनेट मानक

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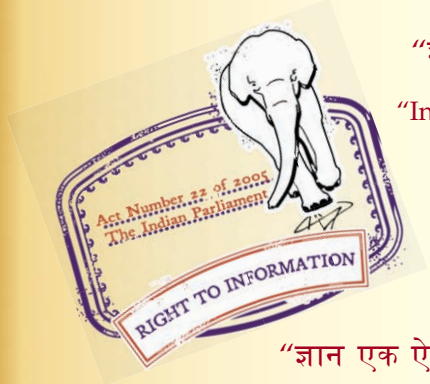
"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 9047-4 (1983): Data sheet for aerial ropeways and cableways, Part 4: Data to be supplied by intending purchaser for aerial system for transportation of goods, underground [MED 6: Continuous Bulk Conveying, Elevating, Hoisting Aerial Ropeways and Related Equipment]



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"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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UDC 658 : 711·6 (083·22) : 625·57

(Reaffirmed 1998)

Indian Standard

DATA SHEET FOR AERIAL ROPEWAYS AND CABLEWAYS

PART 4 DATA TO BE SUPPLIED BY INTENDING PURCHASER FOR AERIAL SYSTEM FOR TRANSPORTATION OF GOODS, UNDERGROUND

Conveyors, Vertical Hoists and Bucket Elevators Sectional Committee, EDC 61; Aerial Ropeways and Cableways Subcommittee, EDC 61 : 5 [Ref : Doc : EDC 61 (3693)]

1. Scope — Covers the technical data to be supplied by the purchaser of the aerial system for the transportation of material in underground mines or other similar places.

2. Data

2.0 *General*

a) Data.....

b) Purchaser.....

c) Location.....

d) Information obtained from.....

e) Maintenance and back-up facilities available.....

f) Persons to be contacted.....

g) Name of project.....

h) Name of consultants, if engaged by the purchaser.....

j) Nature of plant, permanent or temporary.....

2.1 *Capacity*

2.1.1 *Conveying capacity*

a) Up load.....number of tonne/hour

b) Down load.....number of tonne/hour

c) Bucket capacity to be preferred.....t

d) Unit mass to be transported.....t

e) Number of shifts.....

f) Duration of shift.....h

g) Hours of operation during the shift.....h

h) Monthly operation.....days

k) Annual operation.....days

Note — While indicating capacity in tonnes per hour, the point of pick up and discharge point(s) shall be indicated.

2.1.2 *Future plan*

a) Extension of the length to.....m

b) Increase of the capacity to.....t/h

Adopted 9 February 1983 | | Gr 5

INDIAN STANDARDS INSTITUTION
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NEW DELHI 110002

2.1.2.1 *Which is preferable*

a) To increase number of carriers.....

b) To increase the rope speed.....

c) Or both.....

d) Has the purchaser any opinion regarding above.....

.....

2.1.3 *Type of ropeways*

a) Monocable ropeways (up to 400 t/h)/Bicable ropeways (above 400 t/h)/Cableway.....

.....

b) Circulating type.....with fixed/detachable grips

c) Type of cableways.....fixed/Luffing/Travelling

2.2 *Characteristics of Materials*

2.2.1 *For bulk materials*

a) Type of material.....Brick/Sand/Ash/Others

b) Specific gravity.....

c) Maximum lump size.....

d) Size distribution.....

e) Condition of material and to what degree:

i) Wet.....

ii) Dry.....

iii) Sticky.....

iv) Oily.....

v) Abrasive.....

vi) Corrosive.....

2.2.2 *For unit loads*

a) Type of material.....Props/Sleepers/Motors/Bed Plates/Others

b) Size : Maximum....., Minimum.....

c) Mass of unit load : Maximum....., Minimum.....

d) No. to be carried as unit load.....

2.2.3 Feeding arrangement at loading point.....manual/semi-automatic/automatic

i) by what permanent facility.....

ii) by what temporary facility.....

2.3 *Length*

2.3.1 Length of the proposed line.....m

2.3.2 Drawings and maps (The following drawings shall be provided, where available):

a) Topographical maps (state scale and drawing number).....

.....

b) Ground profile (state scale and drawing number).....

.....

c) Longitudinal section of gallery along the route, along the centre line and minimum 6 m on either side of the route.....

.....

d) Station area contour plan (separately for surface terminal, underground terminal and intermediate pickup stations).....

.....

e) Plan of underground obstructions especially at stations.....

.....

f) Details of existing/proposed terminal loading/unloading arrangements.....

.....

g) Give reduced levels of floor and roof of gallery at 3 m interval.....

.....

h) Geological cross-section of seam in case of coal mines.....

2.3.3 *Route*.....Straight/Curving

a) How many feed-on points will be utilized ?

i) Down direction.....

ii) Up direction.....

b) If there are no topographical maps and ground profiles, then give the following information:

i) Difference in height of loading station and unloading stations (surface terminal and underground terminal).....m

ii) Difference in height of intermediate station and loading station (surface terminal) .....m

iii) Difference in height of intermediate station and unloading station (underground terminal).....m

iv) Any appreciable rise or fall along the route.....m

v) Distance between surface terminal and other stations.....m

Note — It is impossible to construct actual curves. A curving route is effected by a series of angled straight lines with angle stations and is not preferable in a bicable ropeways without drive and divide station.

2.3.4 *Presence of any obstacles along the route*

a) Mine haulage track crossing.....

b) Air crossing.....

c) Conveyor installations.....

d) Geological disturbances along the route (give plans of workings and geological disturbances enroute).....

e) Any major roof falls (previous) along the roof.....

f) Any area prone to roof falls.....

g) Other obstacles .....

h) If there are such obstacles, give detailed information on them.....

.....

j) Specify clearance to be provided, if any, in relation to levels.....

.....

2.4 *Location of the Driving Station* — Specify whether the location of the drive station is preferred on.....Loading station/Unloading station/At the drive and divide station

2.5 *Facilities at the Terminal Stations*

2.5.1 *Loading and unloading station*

a) Planning permissions required for site investigation from authorities.....

.....

b) Present method of handling.....

c) Present approximate cost per tonne for:

i) Loading .....

ii) Unloading .....

d) Attached contoured plan of station area.....

e) Details of existing building at station sites (Give surface layout plan) .....

.....

f) Whether existing buildings can be converted to work as stations.....

.....

g) Whether any additional building is to be provided at station, if so, give details.....

.....

2.5.2 *Transportation*

a) Is a full automatic system required for loading and conveying empty carriers on a shunt rail ?.....

b) Is a full automatic system required for unloading and conveying empty carriers on a shunt rail ? .....

c) Is a semi-automatic system required for loading and conveying empty carriers on a shunt rail ? .....

d) Is a semi-automatic system required for loading and conveying empty carriers on a shunt rail ?.....

e) Man-power (technical/non-technical) availability for manual and semiautomatic loading/unloading.....

2.5.3 *Discharge point*

a) Where is the discharge point ?

i) In the unloading station .....

ii) In front of the unloading station.....

iii) On the pocket installed at the unloading station.....

iv) What distance is required for unloading ?.....

v) Is automatic dumping required for carriers ?.....

b) Is a fully automatic system required for conveying empty carriers on the shunt rail.....

.....

c) Attach contoured plans of station areas

.....

2.6 *Available Power* — Information required in **2.6.1** and **2.6.2** shall he provided only in case of long distance permanent ropeways or if usage of electric power is envisaged.

2.6.1 Electric power available at .....station/route

2.6.2 *Electrical equipment*

	Loading Station	Unloading Station
a) *Power Supply:*		
Voltage	 V	 V
Phase	Single/three	Single/three
Cycles	..... Hz	.....Hz
b) *Substation:*	Indoor/Outdoor	
Primary voltage	 V	 V
Secondary voltage	 V	 V
No. of transformers	.....	.....
Available at present:		
kVA capacity	..... kVA	.....kVA
Phase	Single/three	Single/three
Oil or dry	.....	.....
To be added:		
kVA capacity	.....kVA	.....kVA
Single or 3 phase	.....	.....
Oil or dry	.....	.....
c) *New Transformers:*		
To be added by	Purchaser/Supplier	Purchaser/Supplier
Part of tender/separate tender	.....	.....
d) *Motors:*		
Frame Type		
Open	.....	.....
Splash proof	.....	.....
Totally enclosed	.....	.....
Fan cooled	.....	.....

	Loading Station	Unloading Station
e) *Illumination of the Complete System to be Provided:*		
i) By purchaser/supplier	.....	.....
ii) Voltage	 V	 V
iii) Cycles	..... Hz	..... Hz
iv) Incandescent	.....	.....
v) Flourescent	.....	.....
vi) Transformer:		
1) Phase	Single/three	Single/three
2) kVA capacity	.....kVA	.....kVA
3) Primary voltage	 V	 V
4) Secondary voltage	 V	 V
5) Indoor or outdoor type	.....	.....
6) Furnished by	Purchaser/Supplier	Purchaser/Supplier

Note — In case the voltage fluctuations are more than ± 60 percent, it is preferable to either stabilize the same or to go in for steam/diesel/electric generators/drive system in addition to normal power supply.

f) *Night Lighting Required at:*

i) Station .....Yes/No

ii) Intermediate towers.....

iii) Flood light along the line.....

g) *Signalling and Communications System*.....to be/not to be included

Type: Signalling and communication system shall be such that the ropeway system can be stopped from any point on its length.

Signal lights.....

Signal horn .....

Telephone .....

Loud speakers .....

Others .....

2.6.3 *Alternative motive power by*.....Diesel engine or Diesel generator

2.7 *Structures*

2.7.1 Soil Data (for surface, underground and intermediate stations) such as bearing capacity, shear strength, settlement, sliding, characteristic, type of soil.....

.....

2.7.2 The area alongwith alignment.....Private/Public

2.7.3 *Station structures (steel, concrete, wood)*

a) Floors.....

b) Siding.....

c) Roofing.....

d) Windows.....

e) Insulation.....

f) Fireproofing.....

2.7.4 Trestles .....steel/wood/combination

2.7.5 *Storage bins at both terminals*

a) Construction by.....Purchaser/Supplier

b) Design by.....Purchaser/Supplier

c) Required capacity.....

d) Material of construction.....steel/R. C. C./steel with wood liners

e) Has the purchaser any opinion ? .....

2.7.6 *Minimum clearance required along the route*

a) Along the route.....

b) At the surface terminal.....

c) At the underground stations.....

d) Highest intermediate point.....

2.8 *Climate Condition*

2.8.1 *Surface conditions*

a) Temperature (outdoor): Maximum..... °C; Minimum..... °C

b) Humidity (outdoor): Maximum..... %; Minimum..... %

c) Wind velocity: Normal.....km/h, Maximum..... km/h

d) Direction of wind: .....

e) Storm condition:

i) Maximum wind velocity.....

ii) Duration.....

iii) No. of times in year.....

Note — If wind rosette is available, furnish the same.

f) Seismic data.....

g) Land slide data.....

h) Rainfall: Intensity.....; Total rainfall.....mm

j) Duration of rainfall: from..... to.....

k) Snowfall: Intensity.....; Total snowfall.....mm

m) Duration of snowfall: from..... to.....

n) Altitude above mean sea level of driving station.....m

2.8.2 *Underground conditions*

a) Temperature (station site): Maximum..... °C; Minimum..... °C
b) Humidity: Maximum.....%; Minimum.....%
c) Air velocity.....km/h
d) Subsoil water.....present/not present; *p*H value.....
e) Air way.....Intake/Return

2.9 *Erection and Construction*

a) Foundation work by.....Purchaser/Supplier
b) Inland transportation by.....Purchaser/Supplier
c) Supervision by.....Purchaser/Supplier
d) Erection by.....Purchaser/Supplier
e) Commissioning by.....Purchaser/Supplier
f) Who will furnish power, water and compressed air ?.....Purchaser/Supplier
g) General information about unloading facilities, such as:
   i) Available space.....
   ii) Indoor storage.....
   iii) Outdoor storage.....
   iv) Material handling.....
h) Nearest port/delivery station.....
j) Nearest railway station.....
k) Nearest roadway station.....
m) Transportation limitations regarding weight and size, if any.....
   .....
n) Officer's, labourer's and engineer's quarters shall be provided by.....Purchaser/Supplier

2.10 *Local Regulations for Aerial Ropeways and Electricity Rule* — If there are any regulations please attach hereto.....
.....

2.11 *Miscellaneous*

2.11.1 Authorities to be contacted for:

a) Land acquisition.....
b) Jungle clearance.....
c) Road/Highway crossing.....
d) Overhead power transmission line crossing.....
e) Archaeological structures.....
   .....
   .....

Note — Data applicable to special system, if any, may be given under this heading.

EXPLANATORY NOTE

Transportation by rope aerially is another type of transportation systems like railways, roads, etc. The material is transported by means of carrier/carriers suspended on tensioned steel wire rope/wire ropes supported at intervals to limit sagging and thereby prevent the carriers from touching the ground except at planned points.

Aerial ropeways are particularly useful in regions where their ability of surmounting natural barriers givest hem great advantage over other means of transport, such as railways and roads, both of which require heavy civil engineering work to secure easy gradients. Aerial ropeways are in expensive, to maintain, their power demand is modest and they are not seriously affected by adverse climatic conditions. It can negotiate valleys, steep gradients, go in a straight line and is limited by storm conditions and visibility.

The merits of aerial ropeways over other modes of transportation has made aerial ropeways the choice of the mining industry in its daily operations above ground. Mining industry has adopted the aerial ropeways mainly for transporting sand from river banks to pitheads for stowing purposes. In addition aerial ropeways are also being used for transporting coal from pit head/washeries to washeries/steel plants.

In case of underground mining operations, the transportation of mined mineral and material required for daily use in mines are normally transported by a system of haulage transport or other means of conveyance. These system of transport may prove to be bottle necks if not planned properly. In addition these may effect the production of mining unit when transporting materials like rails, sand, bricks, etc, or equipment like motors. In emergenices, these problems may be more acute. The use of aerial ropeways is helpful in overcoming these difficulties.

Further the aerial ropeways may also be used for transport of men in underground mines where the underground workings have extended to distant places. The use of aerial ropeways in such cases will reduce the fatigue and increase the actual working hours of miners thus resulting in increasing efficiency of mining unit.

The aerial ropeways for underground operations have to operate within limited space available in the underground mines. It is therefore of prime importance that the design, selection, installation and maintenance of aerial ropeways is done with utmost care keeping in mind the safety of men material and mine. The first step will, therefore, be to collect the data which may be useful in econominal design of aerial ropeways.

This part of standard aims at listing the data to be supplied to the manufacturers by intending purchaser of an aerial system for transportation of material and mineral products in mines. Other parts aim at listing the data to be supplied to the manufacturers by the intending purchaser of following types of aerial systems :

Part I Transportation of goods, surface
Part II Transportation of passenger, surface
Part III Transportation of passenger, underground
Part V Portable
Part VI Transportation of forestry products.

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